

# EXERCISES

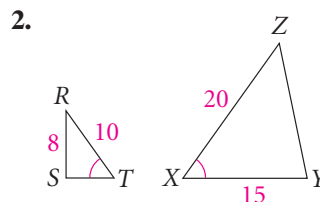
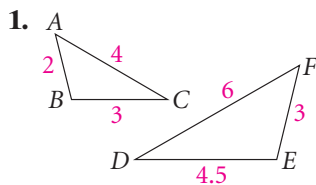
For more practice, see *Extra Practice*.

## Practice and Problem Solving

### **A** Practice by Example

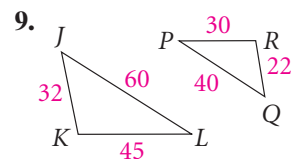
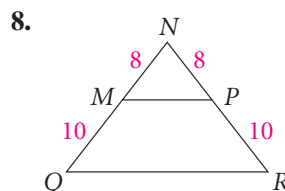
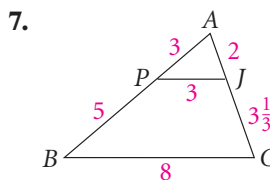
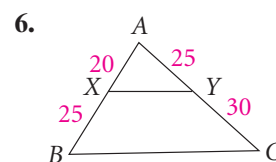
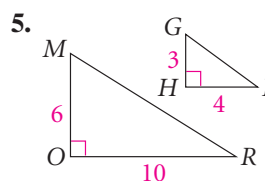
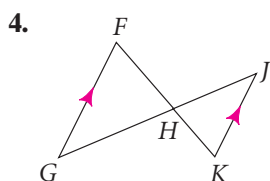
Examples 1 and 2  
(pages 433 and 434)

Can you conclude the triangles are similar? If so, write a similarity statement and name the postulate or theorem you used. If not, explain.

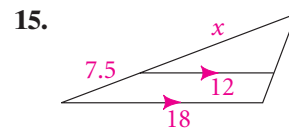
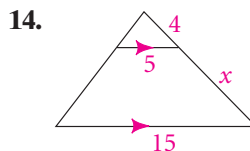
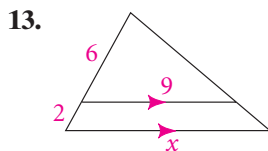
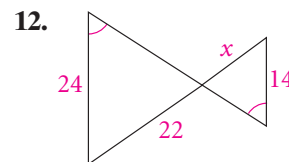
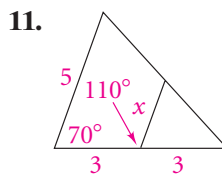
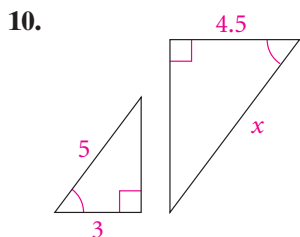


3. If possible, find the similarity ratio for each pair of similar triangles in Exercises 1 and 2. If not possible, explain.

Are the triangles similar? If so, write a similarity statement and name the postulate or theorem you used. If not, explain.



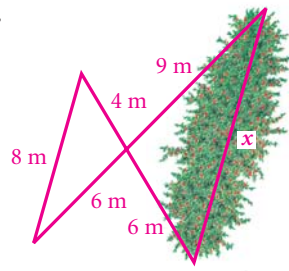
**Example 3** **Algebra** Explain why the triangles are similar. Then find the value of  $x$ .  
(page 434)



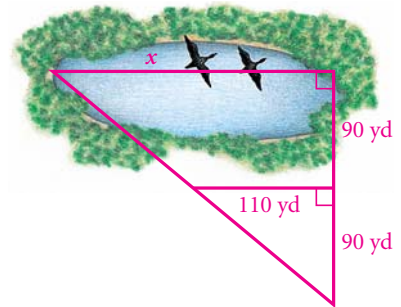
**Example 4**  
(page 435)

**Indirect Measurement** Explain why the triangles are similar. Then find the distance represented by  $x$ .

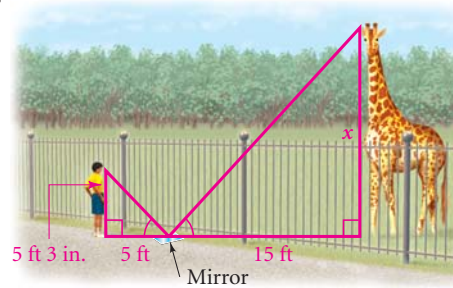
16.



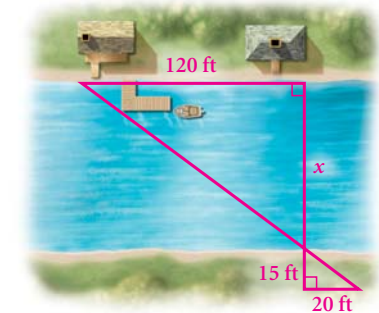
17.



18.



19.



**B Apply Your Skills**

**Skyscraper?**  
**Nein!**

**Hannelore Kraus** of Frankfurt, Germany, stopped the development of a skyscraper because she wanted her apartment to get its fair amount of sunlight. To halt the construction she used a German law that specifies that every homeowner is entitled to sunlight.

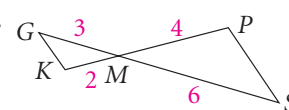
Kraus was offered 1.6 million dollars to drop her lawsuit, but she refused. The skyscraper was scheduled to be 265 m tall and was to be built only 60 m from Kraus's apartment.

**Tall Buildings** Use the news article for Exercises 20 and 21.

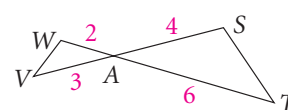
20. **Writing** Explain how Hannelore Kraus could use indirect measurement to estimate the length of the shadow of the building at a particular time of day.
21. **Indirect Measurement** Suppose Ms. Kraus is 1.75 m tall. When her shadow is 1 m long, about how long would the shadow of the proposed building be?
22. a. Classify  $RSTW$ .  
b. Must any of the triangles shown be similar? Explain.
23. a. **Critical Thinking** Are two isosceles triangles always similar? Explain.  
b. Are two isosceles right triangles always similar? Explain.

**Can you conclude that the triangles are similar? If so, write a similarity statement and name the postulate or theorem you used. If not, explain.**

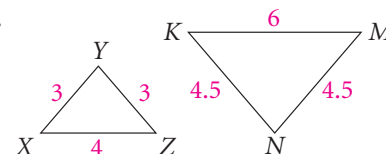
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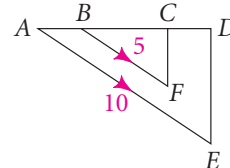
25.



26.



27.



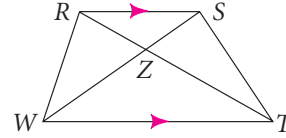
28. **Indirect Measurement** In sunlight, a vertical yardstick casts a 1-ft shadow at the same time that a nearby tree casts a 15-ft shadow. How tall is the tree?

29. **Open-Ended** Name something with a height that would be difficult to measure directly. Describe how you could measure it indirectly.

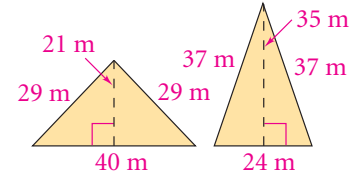
**Find the similarity ratio of the larger to the smaller triangle in each exercise.**

30. Ex. 10      31. Ex. 11      32. Ex. 12      33. Ex. 13      34. Ex. 14  
35. Ex. 15      36. Ex. 16      37. Ex. 17      38. Ex. 18      39. Ex. 19

40. **Constructions** Draw any  $\triangle ABC$ . Use a straightedge and a compass to construct  $\triangle RST$  so that  $\triangle ABC \sim \triangle RST$  with similarity ratio 1 : 3.



41. For each triangle at the right, find:  
a. the perimeter      b. the area  
c. **Critical Thinking** Can you conclude that any two triangles with equal perimeters and equal areas are similar? Explain.

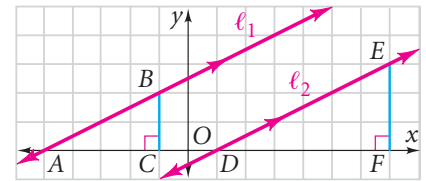


- C Challenge** **Proof** 42. Write a proof of the following:

Any two nonvertical parallel lines have equal slopes.

**Given:** nonvertical lines  $\ell_1$  and  $\ell_2$ ,  
 $\ell_1 \parallel \ell_2$ ,  $\overline{EF}$  and  $\overline{BC} \perp$  to the  $x$ -axis

**Prove:**  $\frac{BC}{AC} = \frac{EF}{DF}$



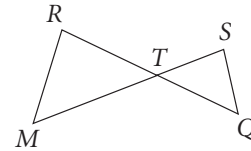
*Hint:* Use the  $x$ -axis as a transversal to show that  $\angle BAC \cong \angle EDF$ .

- Proof** 43. Use the diagram in Exercise 42 on the preceding page.  
Prove: Any two nonvertical lines with equal slopes are parallel.

- Proof** 44. Write a proof of the following.

**Given:**  $RT \cdot TQ = MT \cdot TS$

**Prove:**  $\triangle RTM \sim \triangle STQ$



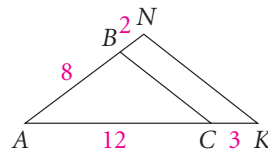


## Standardized Test Prep

### Multiple Choice

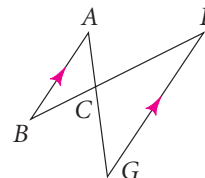
45. Complete the statement  $\triangle ABC \sim \underline{\hspace{1cm}}$ , and identify the reason why the triangles are similar.

- A.  $\triangle AKN$ ; SSS  $\sim$
- B.  $\triangle AKN$ ; SAS  $\sim$
- C.  $\triangle ANK$ ; SAS  $\sim$
- D.  $\triangle ANK$ ; AA  $\sim$



46. Complete the statement  $\triangle ABC \sim \underline{\hspace{1cm}}$ , and identify the reason why the triangles are similar.

- F.  $\triangle LGC$ ; SSS  $\sim$
- G.  $\triangle GLC$ ; SSS  $\sim$
- H.  $\triangle LGC$ ; AA  $\sim$
- I.  $\triangle GLC$ ; AA  $\sim$



### Short Response

47. Suppose  $\triangle VLQ \sim \triangle PSX$ .

- a. Explain how you would find  $m\angle X$  if  $m\angle V = 48$  and  $m\angle L = 80$ .
- b. Find  $m\angle X$ .

### Extended Response



#### Take It to the NET

Online lesson quiz at  
[www.PHSchool.com](http://www.PHSchool.com)

Web Code: afa-0803

48. Hank is 6 ft tall. Hank measured the shadow of a tree and found it to be 30 ft long. He then measured his own shadow. It was 10 ft long.

- a. Draw and label a diagram that you could use to find the height of the tree. Write a similarity statement and justify your answer.
- b. Write a proportion and solve it to find the height of the tree.



## Mixed Review

### Lesson 8-2

$TRAP \sim EZYD$ . Complete each statement.

49.  $\angle T \cong \underline{\hspace{1cm}}$

50.  $\angle D \cong \underline{\hspace{1cm}}$

51.  $\angle A \cong \underline{\hspace{1cm}}$

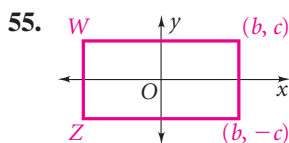
52.  $\frac{AP}{YD} = \frac{RA}{\square}$

53.  $\frac{TR}{RA} = \frac{\square}{ZY}$

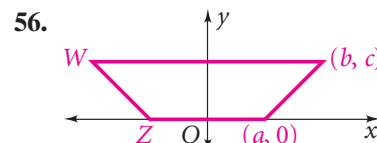
54.  $\frac{DE}{PT} = \frac{\square}{AR}$

### Lesson 6-6

Give possible coordinates of points  $W$  and  $Z$  without using any new variables.



Rectangle



Isosceles trapezoid

### Lesson 5-5

57. A triangle has sides with lengths 9 m and 15 m. Write an inequality that shows the range of possible lengths for the third side.